

**THE CLAIMS**

Claims 1-27. (Canceled)

Claim 28. (Original) A liquid injection device for the introduction of liquid phase organic compounds into a process gas stream, comprising:

a conduit section for coupling into, or forming part of, a conduit for the process gas stream;

a Venturi arrangement housed within the conduit section and including a throat section and a diffuser section downstream of the throat section;

a plurality of nozzles for injecting the liquid phase compound into the Venturi arrangement at, or in close proximity to, the throat section whereby the liquid is atomized to produce droplets which are vaporised by the process gas stream; and

means for introducing a gaseous component into the Venturi arrangement at a location downstream of the nozzles in such a way as to create a moving layer of gas over the surfaces of the Venturi arrangement whereby unvaporised liquid droplets migrating towards such surfaces are prevented from residing in contact therewith.

Claim 29. (Original) A device as claimed in Claim 28 comprising means for partitioning the process gas flow into a first

part which passes through the Venturi arrangement and a second part which by-passes at least part of the Venturi arrangement and is introduced into the Venturi arrangement at said location downstream of the nozzles whereby said second part constitutes said gaseous component used to create said moving layer of gas.

Claim 30. (Original) A liquid injection device for the introduction of liquid phase organic compounds into a process gas stream, comprising:

- a conduit section for coupling into, or forming part of, a conduit for the process gas stream;

- a Venturi arrangement housed within the conduit section and including a throat section and a diffuser section downstream of the throat section;

- a plurality of nozzles for injecting the liquid phase component into the Venturi arrangement at, or in close proximity to, the throat section; and

- means for introducing an auxiliary gas into the Venturi arrangement at the location of injection of the liquid from the nozzles in such a way that the liquid is subjected by the auxiliary gas to shear forces of sufficient magnitude to atomize the liquid.

Claim 31. (Original) A device as claimed in Claim 30 in which

said means for introducing the auxiliary gas comprises a plurality of passageways each associated with a respective nozzle and opening into said conduit, the nozzles being arranged so as to extend with clearance through the passageways so that the liquid phase component and the auxiliary gas are injected into the conduit in co-current fashion.

Claim 32. (Original) A device as claimed in Claim 31 in which the inner extremity of each nozzle is located radially outwardly of the inner peripheral wall of the conduit.

Claim 33. (Original) A liquid injection device for the introduction of liquid phase organic compounds into a process gas stream, comprising:

- a conduit section for coupling into, or forming part of, a conduit for the process gas stream;

- a Venturi arrangement housed within the conduit section and including a throat section and a diffuser section downstream of the throat section;

- a plurality of nozzles for injecting the liquid phase component into the Venturi arrangement at, or in close proximity to, the throat section; and

- means for introducing an auxiliary gas into the Venturi

arrangement at a location immediately downstream of the location of liquid injection, the auxiliary gas being injected in the wake of the liquid injected from the nozzles so as to nullify the localized pressure drop created by the liquid jets.

Claim 34. (Previously Presented) A process for introducing a first organic compound into a conduit through which a hot gaseous stream flows under elevated pressure conditions at variable flow rates, the compound being one which is prone to degrade if allowed to reside in contact with the hot wall or walls of the conduit, said process comprising:

injecting the first organic compound as a liquid phase into the conduit for interaction with the hot gaseous stream whereby, under higher flow rate conditions, the injected stream is atomized to form liquid droplets which are transported by the hot gaseous stream and undergo vaporization; and

at least under relatively lower flow rate conditions in which the hot gaseous stream is less effective to atomise the injected stream, maintaining effective atomisation by injecting a second compound as a gaseous phase stream into the conduit in such a way that the first organic compound is atomized at least in part by interaction between the injected streams.

Claim 35. (Previously Presented) A process as claimed in Claim 34 in which the second compound is also injected into the conduit while said hot gaseous stream is passed through the conduit under said higher flow rate conditions.

Claim 36. (Previously Presented) A process as claimed in claim 34 in which the second compound constitutes a primary reactant for chemical reaction with the first compound.

Claim 37. (Previously Presented) A process as claimed in Claim 34 in which the liquid organic compound injected comprises a halocarbon.

Claim 38. (Previously Presented) A process as claimed in Claim 37 wherein the halocarbon is a chlorocarbon.

Claim 39. (Previously Presented) A process as claimed in Claim 38 wherein the chlorocarbon is a chloroethene or chloroethane.

Claim 40. (Previously Presented) A process as claimed in claim 39 wherein the chloroethene is trichloroethylene or perchloroethylene.

Claim 41. (Previously Presented) A process as claimed in Claim 39 wherein the chloroethane is 1,1,1,2-tetrachloromethane or 1,1,2,2-tetrachloromethane.

Claim 42. (Previously Presented) A process as claimed in Claim 34 in which the liquid phase stream is injected under pressure into the hot gaseous stream at a location where the pressure of the hot gaseous stream is locally depressed.

Claim 43. (Previously Presented) A process as claimed in Claim 42 in which the hot gaseous stream is passed through a Venturi arrangement and in which the liquid phase stream is injected into the hot gaseous stream in the vicinity of a Venturi throat.

Claim 44. (New) A chemical process involving contact between a hot gaseous stream and an organic compound which, when in the liquid phase, is prone to degrade if allowed to reside in contact with a hot surface at or above a predetermined temperature, said process comprising:

atomizing the organic compound by injection thereof into a conduit through which the hot gaseous stream flows, the conduit wall or walls being heated at least in part by the hot gaseous stream to at least said predetermined temperature;

vaporizing the liquid droplets so formed by contact with the hot gaseous stream as the liquid droplets are transported by the hot gaseous stream downstream of the location of injection; and

introducing a gas phase component into the conduit at a location downstream of the location of injection of the organic compound so as to form a boundary layer at the conduit wall or walls for reducing or preventing deposition of the liquid droplets on the conduit wall or walls.

Claim 45. (New) A process as claimed in Claim 44 in which said gas phase component is constituted by part of the hot gaseous stream diverted from the main flow so as to by-pass the injected compound, the diverted part being re-introduced into the conduit downstream of the injection location to form said boundary layer.

Claim 46. (New) A process as claimed in any one of Claim 44 in which the liquid organic compound injected comprises a halocarbon.

Claim 47. (New) A process as claimed in any one of Claim 44 in which the liquid phase stream is injected under pressure into the hot gaseous stream at a location where the pressure of the hot gaseous stream is locally depressed.

Claim 48. (New) A process as claimed in Claim 47 in which the hot gaseous stream is passed through a Venturi arrangement and in which the liquid phase stream is injected into the hot gaseous stream in the vicinity of the Venturi throat.

Claims 49. (New) A process for carrying out a chemical reaction involving a first organic compound which has been vaporized from the liquid phase and a hot gaseous stream containing a second compound, said first organic compound within the liquid phase being prone to degrade if allowed to reside in contact with a hot surface heated by the hot gaseous stream, said process comprising:

injecting said first organic compound as liquid phase stream and said second compound as a gas phase stream into a conduit through which the hot gaseous stream flows so that the first organic compound is atomized at least in part by the interaction between the streams, the liquid droplets so formed being vaporized by contact with the hot gaseous stream, and

thereby suppressing the degradation of said first compound.

Claim 50. (New) A process for carrying out a chemical reaction involving a first organic compound which has been vaporized from the liquid phase and a hot gaseous stream containing a second



compound, said first organic compound within the liquid phase being prone to degrade if allowed to reside in contact with the hot surface heated by the hot gaseous stream, said process comprising:

injecting said first organic compound as a liquid phase stream into a conduit through which the hot gaseous stream flows, the first organic compound being atomized at least in part by interaction with the hot gaseous stream and the droplets so formed to being vaporized by contact with the hot gaseous stream;

injecting said second compound as a gas phase stream into the first conduit downstream of the location of injection of the first compound to compensate for the pressure drop in the wake of the injected stream of said first compound,

thereby preventing deposition of said liquid droplets on the conduit wall immediately downstream of the location of the injection of the first compound, and

thereby suppressing the degradation of said first compound.